

Vaillantella cinnamomea, a New Species of Balitorid Loach from Eastern Borneo

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(Received May, 24, 1993; in revised form November 13, 1993; accepted November 19, 1993)

Abstract *Vaillantella cinnamomea*, new species, is described from the Mahakam basin, Kalimantan Timur, Borneo. It is distinguished from the two other species of the genus by its brown body without conspicuous color pattern, 34–36 + 16–17 = 51–52 vertebrae, and by a combination of morphometric and meristic characters.

Loaches of the genus *Vaillantella* are immediately distinguished by their exceptionally long dorsal fin with 57 to 73 rays. They have been recorded from Borneo, Sumatra, and the Malay Peninsula in western Malaysia and southern Thailand. A record from the vicinity of Chantaburi, south-eastern Thailand, based on a photograph provided by an aquarium fish collector (Kottelat, 1990) seems likely to be reliable, but needs confirmation by new collection. There are few available data on the habitat of these fishes, but the information available in the literature (Tweedie, 1956) and my own observations of *V. maassi* and the new species indicate that they occur in thick accumulations of leaf litter in forest streams.

The systematic position of the genus *Vaillantella* is still unresolved. Vaillant (1902) originally described *V. euepiptera* in the catch-all genus *Nemacheilus*. Fowler (1905) transferred it into a new genus in the family Cobitidae. Nalbant and Banarescu (1977) created the subfamily Vaillantellinae within Cobitidae for the sole genus *Vaillantella*. In his cladistic analysis of the Cobitoidei, Sawada (1982) could only examine radiographs of *Vaillantella* and he concluded that they most likely are nemacheilines. He could not find any character to support Nalbant and Banarescu's (1977) view that *Vaillantella* is most closely related to Botiinae. Parshall (1983) also conducted a cladistic analysis of the Cobitoidei. She considered *Vaillantella* "a derived nemacheiline, which [is] more closely related to the Cobitini than is any other noemacheilid [sic]" (p. 333–334). Parshall's Nemacheilinae (correct spelling) is equivalent to Homalopteridae of Sawada (1982) which have now to be called Balitoridae (Kottelat, 1988;

ICZN, 1993). Therefore I am tentatively accepting *Vaillantella* as a member of the subfamily Nemacheilinae of the family Balitoridae.

The genus *Vaillantella*, as presently understood, includes two species. *Vaillantella euepiptera* was originally described from the Kapuas basin in Borneo (Vaillant, 1902). It has since been recorded twice, from the Kapuas again (Roberts, 1989) and from peninsular Malaysia (Lim, 1993). *Vaillantella maassi* was originally described from Sumatra (Weber and de Beaufort, 1912) on the basis of a single specimen; it has not been collected in Sumatra since. *Vaillantella flavofasciata* Tweedie, 1956, described from the Malay Peninsula, has been considered as a synonym of *V. maassi* by Roberts (1989). *Vaillantella maassi* is known from the Kapuas basin, Borneo (Roberts, 1989), Western Malaysia (Tweedie, 1956), Mae Nam Tapi and Mae Nam Sai Buri basins in peninsular Thailand (pers. obs.), and, tentatively, south-eastern Thailand (see above). These two species are illustrated in Roberts (1989) and Kottelat and Whitten (1993). I report here a third species obtained in the Mahakam river basin, Kalimantan Timur, Borneo.

Material and Methods

The specimens examined belong to the following institutions and collections: CMK, author's collection; MZB, Museum Zoologicum Bogoriense, Bogor; RMNH, Nationaal Natuurhistorisch Museum, Leiden; ZMA, Instituut voor Taxonomische Zoölogie, Universiteit van Amsterdam; ZRC, Zoological Ref-

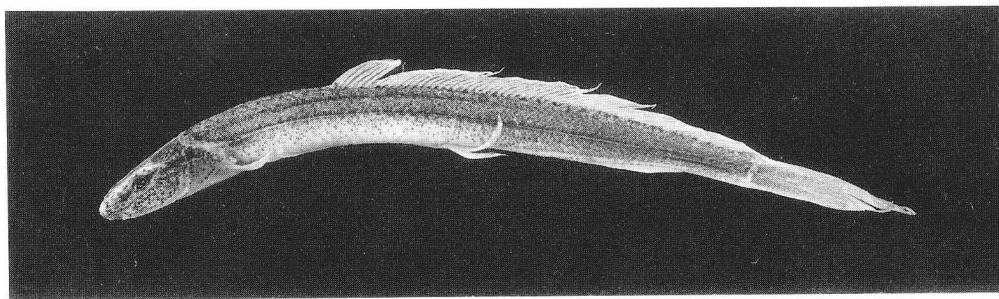


Fig. 1. *Vaillantella cinnamomea*, a paratype, CMK 7776, 41.0 mm SL; Mahakam basin, Borneo.

erence Collection, National University of Singapore. Methods for taking counts and measurements follow Kottelat (1984, 1990), except that all dorsal-fin ray counts were obtained from radiographs. 1/2 in anal and dorsal ray counts refers to the last branched ray born by the same pterygiophore as the penultimate ray. Terminology for vertebral counts follows Roberts (1989).

Vaillantella cinnamomea sp. nov.
(Fig. 1)

Holotype. MZB 5893, 47.8 mm standard length (SL); Borneo: Kalimantan Timur: Mahakam R. basin: Sungei Behernas, a blackwater tributary of Mahakam R. immediately upriver of Merimun; 0°05'S 115°47'E; M. Kottelat, 4 August 1991.

Paratypes. MZB 5894, 1 ex., ZRC 31798, 1 ex., CMK 7776, 3 ex., 24.6–46.6 mm SL; same data.

Diagnosis. *Vaillantella cinnamomea* is distinguished from its two congeners by the following combination of characters: total anal rays 8–9 1/2, total dorsal rays 57–59 1/2, 34–36 + 16–17 = 51–52 vertebrae, lateral head length 19.5–20.2% SL, predorsal length 38.0–40.0% SL, caudal peduncle length 16.1–17.2% SL, a light brown coloration with a faint light yellowish dorsum and a black stripe from tip of snout through eye to opercle, two faint longitudinal stripes on anterior part of body.

Description. General body shape and appearance are shown in Figure 1 and morphometry in Table 1. Body slender, compressed, tapering posteriorly. Head compressed; snout pointed. Axillary pectoral lobe present. No axillary pelvic lobe. Anus close behind pelvic origin. Caudal fin deeply forked, the upper lobe about 1.4 times longer than lower one.

Caudal peduncle 3.33–3.67 times longer than deep. D 57–59 1/2; A 3/5–6 1/2; P 12; V 8; C 9 + 8 branched rays. Vertebrae 34 + 17 = 51 (1), 35 + 16 = 51 (2), 35 + 17 = 52 (1), 36 + 16 = 52 (1). Body entirely covered by scales, except between pectoral fins. Lateral line incomplete, reaching about level of anal fin, with about 60–67 pores. Cephalic lateral line system with 6 supraorbital, 14 infraorbital, 9 preoperculo-mandibular and 5 supratemporal pores.

Anterior nostril at the tip of a short tube. Lips fleshy, without furrows. No median incision in upper lip, no median interruption in lower lip, no median notch in lower jaw. Processus dentiformis present in upper jaw. No sexual dimorphism observed.

Coloration. In 75% ethanol: Body light brown, paler on dorsum, yellowish white on body. A darker stripe (blackish on head) from snout through eye and upper extremity of gill opening to about vertical of anal fin. On body, a second, fainter stripe parallel to and above midlateral one. Head with whitish background. Beside the blackish stripe, cheeks are speckled with blackish spots; nape brown. Fins hyaline, except for a basal longitudinal stripe in each caudal lobe.

In life, general coloration was slightly yellowish brown; no particular colour pattern was observed.

Habitat. *Vaillantella cinnamomea* has been collected in a black water stream under forest cover with quite swift current. The swift current is not perennial for this habitat as it seems to have been caused by a strong lowering of the water level in the Mahakam mainstream which in turn was responsible for draining dry most of its tributaries. As a result, those tributaries which still had water were very swift and had eroded a deep and very narrow channel in what seems to be their usual bed. As at the

time of my visit the water level was reportedly extremely low, it is not known if similar conditions occur every year. Under forest cover, the stream bed was cut through thick alternating layers of dead leaves and sediments. The specimens were obtained by placing a dipnet along the edge of the stream and tramping on the shores or by pulling both sediment and leaves into the dipnet and washing them. Other

species obtained this way were: *Pangio shelfordii* (Poeta, 1903), *Pangio* sp. nov. (Kottelat and Lim, in press a), *Acanthopsoides molobrion* Siebert, 1991, *Lepidocephalichthys pristis* Roberts, 1989, *Barbucca diabolica* Roberts, 1989, and a new genus and species of Chaudhuriidae (Kottelat and Lim, in press b).

Etymology. *Cinnamomea* is a Latin adjective

Table 1. Morphometric data of holotype and the two largest paratypes of *Vaillantella cinnamomea* in percentage of standard length

	Holotype	Paratypes	
Standard length (in mm)	47.8	46.6	41.0
Total length	126.6	126.4	127.6
Dorsal head length	15.5	16.1	17.8
Lateral head length	19.5	19.5	20.2
Predorsal length	38.3	38.0	40.0
Pre-pelvic length	54.0	55.2	53.9
Pre-anus length	57.7	56.2	61.2
Preanal length	76.4	74.7	76.8
Head depth (at eye level)	6.1	6.2	6.6
Head depth (at nape)	7.9	7.9	8.5
Body depth	8.8	8.6	9.5
Depth of caudal peduncle	4.4	5.2	4.9
Length of caudal peduncle	16.1	17.2	16.3
Snout length	5.9	5.8	6.3
Maximum head width	5.9	6.4	7.3
Body width at dorsal origin	5.6	6.0	6.3
Body width at anal origin	2.7	2.8	2.9
Eye diameter	1.9	2.1	2.0
Interorbital width	2.7	3.0	3.4
Length of upper caudal lobe	25.9	24.7	28.6
Length of lower caudal lobe	18.4	17.8	—
Length of median caudal rays	9.8	10.5	—
Length of pelvic fin	9.2	9.4	11.2
Length of pectoral fin	9.4	9.0	9.5

Table 2. Comparison of selected meristic characters of *Vaillantella cinnamomea*, *V. euepiptera* and *V. maassi* based on personal observation and literature sources

	Vertebrae			D	A	n
	Precaudal	Caudal	Total			
<i>V. cinnamomea</i>	34–36	16–17	51–52	57–59 1/2	9 1/2	5
<i>V. euepiptera</i>						
Kapuas (lectotype)	34	19	53	59 1/2	8 1/2	1
Kapuas (from Roberts, 1989)	33–35	19–21	52–54	—	7	6
Kapuas (pers. obs.)	34–35	18–20	52–54	58–64 1/2	8–9 1/2	4
Malay Peninsula (from Lim, 1993)	35	17	52	58	9	1
<i>V. maassi</i>						
Sumatra (holotype)	39	20	59	73 1/2	16 1/2	1
Kapuas (pers. obs.)	37	21	58	64 1/2	13 1/2	1
Kapuas (from Roberts, 1989)	38	19	57	—	—	2
Malay Peninsula (from Roberts, 1989)	39–40	20	59–60	—	—	2

meaning light brown.

Comparison. *Vaillantella cinnamomea* is distinguished from both congeners *V. euepiptera* and *V. maassi* by its light brown body without conspicuous pattern, beside two faint darker stripes on anterior part of body. The dorsum is fainter brown but does not exhibit any contrasting coloration or colour pattern as do both other species. *Vaillantella euepiptera* has a marmorated body, a conspicuous black stripe from eye to opercle, a white axial stripe along side at mid-height, and a conspicuous pale (orange in freshly preserved material; Lim, 1993), irregular stripe on top of head, and between nape and dorsal origin, sometime broken up into a series of blotches. *Vaillantella maassi* in life has a bluish brown body with a conspicuous orange (yellow in preserved material) stripe extending from tip of snout to caudal base along dorsal midline; in preserved specimens, the body is dark brown, the dorsal stripe yellow and still conspicuous.

Vaillantella cinnamomea is further distinguished from *V. euepiptera* by having fewer caudal vertebrae (16–17, vs. 18–20) (Table 2), a longer head (lateral head length 19.5–20.2% SL, vs. 16.8–19.2), a greater predorsal length 38.0–40.0% SL (vs. 32.7–34.3), and a shorter caudal peduncle (length 16.1–17.2% SL, vs. 20.3–21.5). The modal values of the anal-ray counts differ for the two species: *V. cinnamomea* has $8\frac{1}{2}$ (1), $9\frac{1}{2}$ (4) and *V. euepiptera* has $8\frac{1}{2}$ (4), $9\frac{1}{2}$ (1). The single specimen of *V. euepiptera* known from the Malay Peninsula has only 17 caudal vertebrae, but agrees with the Borneo material for all other characters as far as can be said from the description and photographs in Lim (1993).

Vaillantella cinnamomea is further distinguished from *V. maassi* in having only $9\frac{1}{2}$ total anal rays (vs. 13–16 $\frac{1}{2}$), 57–59 $\frac{1}{2}$ total dorsal rays (vs. 61–73 $\frac{1}{2}$) and fewer vertebrae (34–36+16–17=51–52, vs. 37–40+19–21=57–60).

The Kapuas specimens of *V. maassi* agree well with the original description of *V. flavofasciata* from the Malay Peninsula. These two nominal species have been synonymized by Roberts (1989) who just stated having compared one of the paratypes of *V. flavofasciata* with his Kapuas specimens (which he identified as *V. maassi*) and considered them conspecific. Noteworthy is that no color pattern is distinct on the holotype of *V. maassi* (and only known specimen from Sumatra) and none was described by Weber and de Beaufort in their original

description (1912), while for the other species obtained by Maas in the same collection they could provide descriptions and illustrations of colour and colour pattern in close agreement with what can be observed today on fresh specimens. With a total dorsal-ray count of 73 $\frac{1}{2}$, the holotype is beyond the upper limit of the range reported for the species from Malay Peninsula (61–70; Tweedie, 1956) and Borneo (64–71; pers. obs.; Nalbant and Banareescu, 1977). The real status of *V. flavofasciata* probably cannot be solved without collecting fresh topotypical material of *V. maassi*.

Comparative material. *Vaillantella euepiptera*: RMNH 7781, lectotype, 67.2 mm SL; Borneo: "Pontianak, Kapoeas (Sintang)" (two localities obviously mixed; see Vaillant, 1902: 140, for original data); M. Moret, January–February 1895, J. Büttikofer, July 1894.—ZMA 116.538, 4 ex., 56.1–79.0 mm SL; Borneo: Kapuas basin: Sungai Seriang, a tributary of Sungai Palin, 37 km W of Putussibau; T. R. Roberts, 12 August 1976. *V. maassi*: ZMA 100.993, holotype, 76.6 mm SL; Sumatra: Gunung Sahilan on Kampar Kiri river; J. P. Kleiweg de Zwaan.—ZMA 116.539, 1 ex., 66.9 mm SL; Borneo: Kapuas basin: Sungai Melawi, about 0.5 km upstream of Sintang; T. R. Roberts, 18 August 1976.

Acknowledgments

I thank PHPA ranger Muhammad Ali Moestafa (Andy) and boatman Armain for their help in the field, and Soetikno Wirjoatmodjo (LIPI Biologi, Bogor) for administrative support, Martien van Oijen (RMNH), Isaäc Isbrücker and Han Nijssen (ZMA) for the loan of comparison material and Marianne Müller for preparing Figure 1. The Indonesian Forestry Department (Direktorat Jenderal Perlindungan Hutan dan Pelestarian Alam-PHPA) issued a permit to collect in the Mahakam basin.

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東部ボルネオから得られた *Balitoridae* の 1 新種

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ミミズ型の体形で知られる *Vaillantella* (*Balitoridae*: フクドジョウ亜科) の未記載種を東部ボルネオ・マハカム川水系より 6 個体採集し, *V. cinnamomea* として記載した。新種は同族の *V. euepiptera* や *V. maassi* と臀鰭軟条数 $9\frac{1}{2}$, 脊椎骨数 $34-36+16-17=51-52$, 薄い茶色の体色, 吻端から鰓蓋に及ぶ 1 本の黒色帯, 体前部の不明瞭な 2 本の縦帯を合わせ持つことにより区別できる。